

APPENDIX

DIGITAL DATABASE DESCRIPTION FOR THE GEOLOGIC MAP OF UPPER CLAYHOLE VALLEY AND VICINITY, MOHAVE COUNTY, NORTHWESTERN ARIZONA

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INTRODUCTION

This appendix serves to introduce and describe the digital files that are included in this publication, available for downloading at <http://geopubs.wr.usgs.gov>. These files include a set of ARC/INFO geospatial databases containing the geologic information as well as Adobe Portable Document Format (PDF) and Postscript plot files containing images of the geologic map sheet and the text of an accompanying pamphlet that describes the geology of the area.

The digital map publication, compiled from previously published and unpublished data and new mapping by the author, represents the general distribution of surficial and bedrock geology in Upper Clayhole Valley and vicinity. Together with the accompanying geologic description pamphlet, it presents current knowledge of the geologic structure and stratigraphy of the area covered. The database identifies map units that are classified by age and lithology following the stratigraphic nomenclature of the U.S. Geological Survey. The scale of the source maps limits the spatial resolution (scale) of the database to 1:31,680 or smaller. The content and character of the database, as well as three methods of obtaining the database, are described below.

FOR THOSE WHO DON'T USE DIGITAL GEOLOGIC MAP DATABASES

Two sets of plot files containing images of much of the information in the database are available to those who do not use an ARC/INFO compatible Geographic Information System. The Postscript plotfile package contains an image of the geologic map sheet. The Adobe PDF plotfile package contains images of the map sheet, pamphlet, and this document. Those who have computer capability can access the plot file packages in either of the two ways described below (see the section "Obtaining the digital database and plotfile packages"); however, these packages do require gzip or WinZip utilities to access the plot files.

Those without computer capability can obtain plots of the map files through U.S. Geological Survey Information Services. Be sure to request Map MF-2418

U.S. Geological Survey Information Services
Box 25286
Denver, CO 80225

1-888-ASK-USGS

Email: ask@usgs.gov

DATABASE CONTENTS

The database consists of three digital packages. The first is the PostScript Plotfile Package which consists of PostScript plot files of the geologic map and map explanation. The second is the PDF Plotfile Package which contains the same plot files as the first package, as well as the database description, but in Portable Document Format (PDF). The third is the Digital Database Package which contains the geologic map database itself and the supporting data.

PostScript Plotfile Package

The package contains the PostScript image described below:

cvmap.eps A PostScript plotfile containing the complete map composition with geology, correlation chart, and geologic description at a scale of 1:31,680

The PostScript image of the geologic map and map explanation is 42 inches high by 40 inches wide, so it requires a large plotter to produce paper copies at the intended scale. The PostScript plotfile of the geologic map was initially produced using the 'display' command with the Adobe Illustrator option with compression set to zero in ARC/INFO version 8.0. The geologic description and correlation chart were created in Adobe Illustrator 8.0.

PDF Plotfile Package

The package contains the PDF images described below:

cvmap.pdf	A PDF file containing the complete map composition with geology, correlation chart, and geologic description at a scale of 1:31,680
cvgeo.pdf	A PDF file of the pamphlet, containing detailed geologic information and unit descriptions, and appendix
cvreadme.pdf	This appendix

Adobe Acrobat PDF (Portable Document Format) files are similar to PostScript plot files in that they contain all the information needed to produce a paper copy of a map or pamphlet and they are platform independent. Their principal advantage is that they require less memory to store and are therefore quicker to download from the Internet. In addition, PDF files allow for printing of portions of a map image on a printer smaller than that required to print the entire map without the purchase of expensive additional software. The PDF image of the geologic map and map explanation was created from a PostScript file using Adobe Acrobat Distiller. The PDF image of the pamphlet was produced in Microsoft Word 2000 using the 'Convert to Adobe PDF' option from the Acrobat pulldown. In test plots we have found that paper maps created with PDF files contain almost all the detail of maps created with PostScript plot files. We would, however, recommend that those users with the capability to print the large PostScript plot files use them in preference to the PDF files.

To use PDF files, the user must get and install a copy of Adobe Acrobat Reader. This software is available **free** from the Adobe website (<http://www.adobe.com/>). Please follow the instructions given at the website to download and install this software. Once installed, the Acrobat Reader software contains an on-line manual and tutorial.

There are two ways to use Acrobat Reader in conjunction with the Internet. One is to use the PDF reader plug-in with your Internet browser. This allows for interactive viewing of PDF file images within your browser. This is an easy way to quickly look at PDF files without downloading them to your hard disk. The second way is to download the PDF file to your local hard disk, and then view the file with Acrobat Reader. **We strongly recommend that large map images be handled by downloading to your hard disk**, because viewing them within an Internet browser tends to be very slow.

To print a smaller portion of a PDF map image using Acrobat Reader, it is necessary to cut out the portion desired using Acrobat Reader and the standard cut and paste tools for your platform, and then to paste the portion of the image into a file generated by another software program that can handle images. Most word processors (such as Microsoft Word) will suffice. The new file can then be printed. Image conversion in the cut and paste process, as well as changes in the scale of the map image, may result in loss of image quality. However, test plots have proven adequate. Superior quality can be obtained by using image processing software that can open PDF files (like Adobe Photoshop Elements) to crop and print a portion of the map.

Digital Database Package

The database package includes geologic map database files for the map area. The digital maps, or coverages, and their associated INFO directories have been converted into ARC/INFO export files. These export files are

uncompressed and are easily handled and compatible with some Geographic Information Systems other than ARC/INFO. Please refer to your GIS documentation.

ARC export files are converted to ARC/INFO format using the ARC command 'import'. To ease conversion and preserve naming convention, an AML is enclosed that will convert all the export files in the database to coverages and will also create an associated INFO directory. From the ARC command line type *&r import.aml*. The export files included are listed below.

<u>ARC/INFO export file</u>	<u>Resultant Coverage</u>	<u>Description</u>
cv_poly.e00	cv_poly	Polygon and line coverage showing depositional contacts, rock units, and faults
cv_anno.e00	cv_anno	Line coverage showing annotation and annotation leaders
cv_dip.e00	cv_dip	Point coverage showing strike and dip information, collapse structures, sinkholes, and volcanic vents
cv_fold.e00	cv_fold	Line coverage showing fold axes and basalt flow lines
Geo.lin.e00	geo.lin	Lineset
Geo.mrk.e00	geo.mrk	Markerset
wpgcmyk.shd.e00	wpgcmyk.shd	Shadeset
geomrk.lut.e00	geomrk.lut	Lookup table for point symbols
geolin.lut.e00	geolin.lut	Lookup table for line types
geofont.txt.e00	geofont.txt	Text set used for all annotation

The database package also contains the following files:

import.aml	ASCII text file in ARC Macro Language to convert ARC export files to ARC coverages in ARC/INFO
cvtopo.zip	cvtopoclean.tif & cvtopo.tfw Background hypsography image and World file
Mf2418.txt	A text-only file containing an unformatted version of readme.pdf
Mf2418met.txt	A parseable text-only file of publication level FGDC metadata for this report
Rev_history_MF2418.doc	A Word file describing revisions, if any, to this publication

The following supporting directory is not included in the database package, but is produced in the process of reconverting the export files into ARC coverages.

info/ INFO directory containing files supporting the database

OBTAINING THE DIGITAL DATA

The digital data may be obtained in either of two ways:

- a.) From the Western Region Geologic Publication Web Page at:
<http://geopubs.wr.usgs.gov/docs/wrgis/mf-map.html>

Follow the directions to download the files.

- b.) From the U.S. Geological Survey Western Region FTP server. The FTP address is:
geopubs.wr.usgs.gov

The user should log in with the user name 'anonymous' and then input their e-mail address as the password. This will give the user access to all the publications available by FTP from this server. The files in this report are stored in the subdirectory: pub/map-mf/mf2418.

DATABASE SPECIFICS

Digital compilation

Scribecoat mylar sheets were scanned at the U.S. Geological Survey Flagstaff Science Center on an Optronics 5040 raster scanner at a resolution of 50 microns (508 dpi). The scans were output in TIFF format and converted to ARC/INFO grids. The grids were registered and rectified to four latitude/longitude registration points. Linework was vectorized using 'gridline'. The lines were edited and attributed in ARC/INFO. Polygons were built and attributed in ARC/INFO. Point data were digitized on screen and then attributed in ARC/INFO.

Map Projection

<u>Parameter</u>	<u>Description</u>
Projection	UTM
Units	Meters on the ground
Zone	12
Datum	NAD27

Database Fields

The content of the geologic database can be described in terms of the lines, points, and areas that compose the map. Each line, point, or area in a map layer or index map database (coverage) is associated with a database entry stored in a feature attribute table. Each database entry contains both a number of items generated by ARC/INFO to describe the geometry of the feature and one or more items defined by the authors to describe the geologic information associated with that entry. Each item is defined as the amount and type of information that can be recorded. Descriptions of the database items use the terms explained below.

<u>Parameter</u>	<u>Description</u>
Item Name	Name of database field
Width	Maximum number of characters or digits stored
Output	Output width
Type	B - binary integer; F- binary floating point number, I - ASCII integer, C - ASCII character string
N.Dec	Number of decimal places maintained for floating point numbers

LINES

The arcs are recorded as strings of vectors and described in the arc attribute table (AAT). They define the boundaries of the map units in cv_poly. These distinctions and the geologic identities of the boundaries are stored in the LTYPE field according to their line type.

Definition of cv_poly and cv_fold Arc Attribute Tables

<u>Item Name</u>	<u>Width</u>	<u>Output</u>	<u>Type</u>	<u>N.Dec</u>	<u>Description</u>
FNODE#	4	5	B	—	Starting node of the arc
TNODE#	4	5	B	—	Ending node of the arc
LPOLY#	4	5	B	—	Polygon to the left of the arc
RPOLY#	4	5	B	—	Polygon to the right of the arc
LENGTH	8	18	F	5	Length of the arc in meters
<COVERAGE>#	4	5	B	—	Unique internal number
<COVERAGE>-ID	4	5	B	—	Unique identification number
LTYPE	35	35	C	—	Line type
PTTYPE	35	35	C	—	Arcmarker symbol
PLUNGE	3	3	I	—	Coded integer indicating fold plunge (in cv_fold only)

Domain of Line Types recorded in LTYPE field

cv_poly

contact_certain
 landslide_scarp
 map_boundary
 normal_flt_approx
 normal_flt_certain
 normal_flt_concealed
 normal_flt_inferred

cv_fold

anticline_certain_red
 anticline_concealed_red
 basalt_flow_direction
 monocline_certain_red
 monocline_concealed_red
 plunging_anticline_concealed_red
 plunging_anticline_red
 plunging_syncline_concealed_red
 plunging_syncline_red
 syncline_certain_red
 syncline_concealed_red
 syncline_inferred_red

Domain of arcmarkers recorded in PTTYPE field

cv_poly

fault_ball_fill
 xx

cv_fold

anticline_red
 monocline_red
 syncline_red
 xx

POLYGONS

Map units (polygons) are described in the polygon attribute table (PAT). This identifies the map units recorded in the PTYPE field by map label. The description of map units can be found on the geologic map sheet.

Definition of cv_poly Polygon Attribute Table

<u>Item Name</u>	<u>Width</u>	<u>Output</u>	<u>Type</u>	<u>N.Dec</u>	<u>Description</u>
AREA	8	18	F	5	Area of polygon in square meters
PERIMETER	8	18	F	5	Length of perimeter in meters
<COVERAGE>#	4	5	B	—	Unique internal number
<COVERAGE>-ID	4	5	B	—	Unique identification number
PTYPE	5	5	C	—	Map unit label

Domain of cv_poly PTYPE (map units)

Ph	Pkf	Pkh	Ptb	Pts	Ptw	Qa1
Qa2	Qab	Qaf	Qap	Qb1	Qc	Qcbb
Qcbi	Qcbp	Qf	Qg1	Qg2	Qg3	Qgrb
Qgri	Qgrp	Qhb	Qhi	Qhp	Qi	Ql
Qltb	Qlti	Qltp	Qmb	Qmkb	Qmkp	Qmp
Qp1	Qs	Qsb	Qsi	Qskb	Qskp	Qsp
Qt	Qv	TRml	TRmlt	TRmm	TRms	TRmt
TRmv						

Plain text is substituted for conventional geologic age symbols (TR for Triassic) shown on map.

POINTS

Points represent geographic features that have no area or length, or features that are too small for their boundaries to be apparent for the given input scale. Each point is described by a single x,y coordinate. A point attribute table (PAT) is used to hold the attribute data about points. ARC/INFO coverages cannot hold both point and polygon information.

Definition of cv_dip Point Attribute Table

<u>Item Name</u>	<u>Width</u>	<u>Output</u>	<u>Type</u>	<u>N.Dec</u>	<u>Description</u>
AREA	8	18	F	5	Area (degenerative)
PERIMETER	8	18	F	5	Perimeter (degenerative)
<COVERAGE>#	4	5	B	—	Unique internal number
<COVERAGE>-ID	4	5	B	—	Unique identification number
PTTYPE	35	35	C	—	Point type
DIP	3	3	I	—	Dip angle in degrees
STRIKE	3	3	I	—	Strike angle in degrees

Domain of cv_dip PTTYPE

bedding	approx_bedding
collapse_structure	sinkhole
vertical_joint	volcanic_vent

ANNOTATION

Annotation for geologic unit labels and fault offsets are contained in **cv_anno** in subclass `anno.unit`. **cv_dip** also contains annotation, such as that for strike and dip, collapse features, and geographic feature names.

The text set used for all annotation was `geofont.txt`. Use of this text set allows for proper symbol notation for unit symbols. The default `ARC/INFO` text set does not allow for a proper geologic symbol indicating 'Triassic.' By using this alternate text set, the character pattern '^m' prints instead as ^m. The only non-conventional text symbol used, was the '^' (carat) indicating Triassic.

SPATIAL RESOLUTION

Use of this digital geologic map database should not violate the spatial resolution of the data. Although the digital form of the data removes the constraint imposed by the scale of a paper map, the detail and accuracy inherent in map scale are also present in the digital data. The fact that this database was created and edited at a scale of 1:31,680 means that higher resolution data is generally not present. Plotting at scales larger than 1:31,680 will not yield greater real detail but may reveal fine-scale irregularities below the intended resolution.